Water Quality Analysis of Aksu-Tarim River Based on Remote Sensing Data

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1. Introduction

Based on remote sensing techniques, various methods have been proposed to detect parameters of water quality, monitor their changes and estimate water pollution(Wang Yun-peng, et al. 2001). A well-known conclusion is that, to some extent, water pollution can in fact be detected by remotely sensed image analysis. Combining these images with ground truth observations at the same time, a model can be established to quantitively monitor water pollution.


The study area of this paper is the river of the Aksu-Tarim Basin. How to use TM data and routine monitoring data to monitor water quality are discussed. A water quality-monitoring model is proposed.
2. Study Area

As shown in Fig.1, Aksu lies in the middle part of the South Xinjiang Autonomous Region, at the southern foot of Tian Shan Mountains, the northern fringe of Tarim Basin. The range of its geographic coordinates are 78°02' ~ 84°07'E, 39°30' ~ 42°40'N. It is respectively adjacent to Bayingguoleng in the east, Kazakhstan in the northwest, Taklamagan in the south and Ili in the north. It is about 510 kilometers from east to west, 350 kilometers from north and south. Its area is 132,500 km², accounting for 1.38% of the area of China.

Fig.1 The map of study area

In recent years, along with the economic development of the drainage area, intensive
and exploitation of upstream areas has occurred. The amount of incoming water has been gradually reduced in the midstream and downstream segment of the Tarim River (JI Fang, et al. 2000). At the same time, the amount of highly-mineralized water directly draining into this river has increased. Water pollution has become seriously (MA Ying-jie, et al. 1999). Especially since the 1970 year, with increased human activities, Water consumption dramatically increased in the middle segment. The volume of salt aggregation is large in the Accra River valley. The improvement of removing salt and meliorating soil further increase the degree of mineralization of this river and blocks the agriculture development along the river of Tarim Basin. The amount is of chlorides, sulphates and mineralization exceed standard levels, which prove that water pollution in the Tarim Basin is mainly due to the salinization of soil.

According to monitoring data from 1985 through 1998, the rates of mineralization in Allard, Xinquman and Kalanian are respectively 1.85g/L, 1.37g/L and 1.34g/L. they document that the mineralization rate increases with the increase of the flow, that the mineralization rate is low upstream, and a high in downstream. The reason is that the upstream absorbs a large amount of farmland water. Therefore, in order to improve water quality, drainage from farmland to the river must be restricted.

However, development of the economy must boost the drainage from farmland the Aksu-Tarim valley. In order to fulfill sustainable development in agriculture, it is necessary to the change farmland drainage and their adequate influence on Aksu-Tarim valley. Therefore, remote sensing techniques are employed in this area. Because it is a advanced techniques in nowadays.

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